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Production in Great Britain in 1924.

Summary of Preliminary Reports.

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PRODUCTION IN GREAT BRITAIN IN 1924.

SUMMARY OF PRELIMINARY REPORTS.

The preliminary reports on the Third Census of Production taken in respect of the year 1924 have been set out in a series of supplements to the "Journal" issued from 24th February, 1927, to 8th March, 1928. It is now possible, therefore, to make some general and provisional comparison of the industrial output of this country in 1924 with that at the date of the First Census, namely, 1907. For the entire field of industry comparisons with the results of the Second Census, relating to 1912, cannot be made, as the survey on that occasion was incomplete.

In the interval between the First and Second Census the population of the United Kingdom had increased by about 4½ per cent., and the industrial population within the scope of the second of the surveys showed an increase of about 9 per cent. on the corresponding total for 1907. It is not possible to say how far, if at all, that part of the industrial population of 1912 in respect of which Returns were not required may have increased at a less or at a greater rate than the numbers covered by the inquiry. Some of the data secured in respect of 1912 are of value, in spite of the fact that the work of correcting and completing defective returns could not be carried on after the outbreak of war. The fact that the form of the information regarding the use of electrical power was amended on the occasion of the 1912 enquiry will be found of particular value in reference to the extension of the use of such power since the date of the first enquiry.

Numbers Employed in Industry.

COMPARISON WITH PERSONS GAINFULLY OCCUPIED.

The first place in importance is taken by the numbers of persons covered by the surveys for 1907 and 1924. As shown in a table on p. iv, the aggregates for the two sexes were as follows, the figures being stated to the nearest hundred.

	1907.	1924.
Males	5,064,000	5,746,100
Females	1,623,500	1,866,700
Total	6,687,500	7,612,800

These numbers are exclusive of outworkers, who numbered 97,000 on the occasion of the First Census and 44,000 in 1924. The 1907 figures also exclude certain trades of minor importance covered by the earlier survey, but not by that of 1924. The figures refer to the totals recorded as employed on the average of the prescribed dates on each occasion. For 1924 monthly figures were required for the operative staff, while for 1907 quarterly figures for all staff employed were asked for.

It is both of interest and importance to ascertain, as nearly as the available information permits, the relation of the variation in numbers employed in manufacturing and mining undertakings to the total of the occupied population at the dates compared. The question of importance is: Has industry provided for a declining or for an increasing proportion of the working population? As the above figures show, the numbers actually employed in industry increased by 13·47 per cent. in the case of males and by 14·99 per cent. in that of females, the total number increasing by 13.84 per cent.

The total numbers of the persons gainfully occupied are only ascertained on the occasions of the decennial Census of population. It is, however, possible to estimate the numbers at a date between two consecutive censuses on the assumption that the variations are continuous and approximately regular. If the numbers should vary irregularly in relation to the total population, the procedure indicated would fail to furnish close estimates. On this assumption of regular movement, the numbers in gainful occupations at the middle of 1907 in Great Britain would be, approximately, 12,390,000 males and 5,165,000 females. For 1924 it is necessary to estimate the rate of change subsequent to 1921, the date of the most recent census. Both for England and Wales and for Scotland official estimates of the aggregate population of each sex at the middle of 1924 are available as a basis of calculation. For England and Wales there is, in addition, an estimate, furnished in the Statistical Review of the Registrar General, of the distribution of the population of each sex in age groups. This is particularly useful for the purpose in hand in view of the changes in progress in the proportions of the population in the active years of life and at ages below and above that period. Assuming that the proportion of all living at these ages who were in gainful occupations in 1924 was the same for each sex as in 1921, the totals obtained are, approximately, 12,600,000 males and 5,210,000 females.

For Scotland no corresponding estimate of the intercensal age grouping of the population has been published. The estimated totals of males and females living in Scotland in 1924 differ by only a few hundreds from those reported for the date of the 1921 Census. While it appears probable that the numbers in the active period of life may have increased, in spite of a small decline in total numbers, it will be best for the present purpose to use the figures given in the Report on the Census of 1921, namely, 1,543,000 males and 636,000 females in gainful occupations. It is not improbable that an addition of between 2 and 3 per cent. should be made to these figures.

Adding the figures for England and Wales and those for Scotland, we have 14,143,000 males and 5,846,000 females, or a total of 19,989,000. Thus, practically 20,000,000 persons may be estimated to have been in gainful occupations in 1924. This figure, however, differs from the total obtained from the Census of Production Returns in that in the former there are included those persons who were absent from work on one or more of the dates for which the figures reported to the Census of Production Office show the numbers actually occupied. These absentees, whether their absence was due to sickness, lack of employment, or any other cause, were, it is well known, more numerous relatively to the total in 1924 than in 1907, in view of the greater unemployment at the later date.

Taking all in gainful occupations, whether present or absent on any given days, the increase shown by the numbers given above, comparing the year 1924 with the year 1907, was 14·15 per cent. for males and 13·18 per cent. for females, or, for both sexes together, 13·87 per cent. For males and females together the ratio of increase of persons in employment in industry was thus practically identical with that of all persons having a gainful occupation, whether exercising that occupation or not.

The estimates of the aggregates of persons having a gainful occupation show an increase of 1,753,000 males and 681,000 females, and the Census of Production data account for 682,000 of the former and 243,000 of the latter. In 1907, the percentage of the males having a gainful occupation who were recorded in the Census of Production Returns was 40·87, and that of the females 31·43. In 1924 the percentages were 40·63 and 31·93, and the inclusion of an estimate of increase between 1921 and 1924 in the numbers gainfully occupied in Scotland might reduce these figures to about 40·4 and 31·5. The corresponding percentages of the numbers actually at work on any given date in 1907 and 1924 would be higher than these figures, and, as the differences would be greater for

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

1924 than for 1907, the figures may be interpreted as showing that, both for males and for females, the industrial undertakings covered by the Census of Production enquiries provided a somewhat greater proportion in 1924 than in 1907 of the total employed in all occupations. It follows that if, as has been supposed, there has been an increase of the distributive trades relatively to the manufacturing industries, that increase has not been at the expense of the manufacturing industries in the sense that the numbers engaged in them form a diminished fraction of the total occupied population, since the contrary has been the case. In this connection, however, it may be important to note that some groups of manufacturers have been carrying out, in a greater degree than formerly, the preparation of their products for distribution, so that, of those recorded as employed by manufacturing firms, a larger number than at the First Census are now engaged on tasks of a class carried out mainly by firms whose work is outside the range of a Census of Industrial Production. It should be added that the effect of these changes on the aggregates of all those covered by the Census Returns does not appear to have been important, though, as noted below, some sections of those enumerated may have been affected numerically to an extent that was sufficient to modify the proportions contributed by these sections to the general totals.

While the comparisons given above involve the use of a number of assumptions in dealing with elements not on record which are necessary for the calculations, it is believed that the general character of the results reached is not dependent on the precise assumptions made, and that any variations in them which are within the limits of the probable would leave the general conclusions substantially unaltered.

DISTRIBUTION BY SEX AND BY INDUSTRIES.

The table which follows furnishes a General Summary of the changes in the proportions of the two sexes, and in the proportion of Operative to Administrative and Clerical (including Technical) staff, in a comparison of the aggregates for the principal groups of industries in 1924 and 1907. The figures relate to Great Britain only, and, as the 1924 survey excluded Velvet and Fustian Cutting, Wig Making, and Trade Photography, the figures for these trades have been omitted from the 1907 groups in which they were included:—

(Numbers in Thousands. Figures for 1907 in italics.)

Groups of Trades.	Operative Staff.		Administrative, Technical and Clerical Staff.		Total.
	Males.	Females.	Males.	Females.	
Mines and quarries 1924	1,262·2	5·7	26·0	1·8	1,295·7
1907	*930·2*	*6·1*	*17·7*	—	*954·0*
Iron and steel, shipbuilding, engineering, etc. ... 1924	1,176·9	135·8	147·5	44·1	1,504·3
1907	*1,064·2*	*72·3*	*87·0*	*7·6*	*1,231·1*
Textiles ... 1924	429·7	666·6	45·8	12·6	1,154·7
1907	*452·1*	*665·2*	*36·6*	*3·2*	*1,157·1*
Clothing ... 1924	174·9	410·8	50·2	29·1	665·0
1907	*187·6*	*453·1*	*39·0*	*32·7*	*712·4*
Food, drink and tobacco ... 1924	251·4	161·1	71·2	20·9	504·6
1907	*239·6*	*117·3*	*50·6*	*6·0*	*413·5*
Paper and printing 1924	182·1	111·4	39·9	15·7	349·1
1907	*174·5*	*97·7*	*30·8*	*5·3*	*308·3*
Timber ... 1924	155·3	27·7	27·9	4·7	215·6
1907	*173·0*	*20·3*	*20·9*	*0·7*	*214·9*
Building and building materials ... 1924	561·5	46·9	63·4	10·1	681·9
1907	*615·8*	*36·7*	*46·2*	*3·0*	*701·7*
Public utilities 1924	661·6	5·9	57·9	5·8	731·2
1907	*544·2*	*5·0*	*38·2*	*0·4*	*587·8*
Other trades ... 1924	303·4	126·9	57·2	23·2	510·7
1907	*276·4*	*83·1*	*39·4*	*7·8*	*406·7*
Total ... 1924	5,159·0	1,698·8	587·0	168·0	7,612·8
1907	*4,657·6*	*1,556·8*	*406·4*	*66·7*	*6,687·5*
Total *without Mines and quarries* 1924	3,896·8	1,693·1	561·0	166·2	6,317·1
1907	*3,727·4*	*1,550·7*	*388·7*	*66·7*	*5,733·5*
1924: Under 18 years	410·0	396·0	36·3	24·1	866·4
18 years and over	3,486·8	1,297·1	524·7	142·1	5,450·7
1907: Under 18 years	*473·4*	*389·0*	*34·6*	*9·8*	*906·8*
18 years and over	*3,254·0*	*1,161·7*	*354·1*	*56·9*	*4,826·7*

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

The proportion of males to females recorded as engaged in the industries to which the Census applied was, it will be seen, roughly, 3 to 1 both in 1907 and in 1924, the proportion of females being, more precisely, 24·3 per cent. in 1907 and 24·5 per cent. in 1924. The figures indicate that, over the entire range of industries covered, no significant displacement of males by females occurred. A considerable proportion of the total increase in numbers took place in the extractive industries included in the first of the groups in the table, a group in which, through the nature of the work, males predominate in an exceptional degree. This consideration makes a comparison of the aggregates shown at the foot of the table, which are exclusive of the first group, of particular interest. In these manufacturing industries the proportion of females employed has increased from 28·2 per cent. to 29·4 per cent. The number of females recorded for 1924 exceeds by nearly 80,000 the numbers which would have been shown if, without changing the total employed, the proportion of females to males had been the same as in 1907. This excess represents one-third of the recorded increase of females in the manufacturing trades. The total of the administrative and clerical section of those employed has increased by 271,800, of which total 99,500 is the increase of females. The latter figure represents an increase of nearly 150 per cent., and suggests that is in clerical staffs mainly that the increases have occurred which result in the increased proportion of females in the aggregate.

The total increase in the manufacturing trades has been 341,700 (8·3 per cent.), in the male staffs, and 241,900 (15 per cent.), in the female staffs. In the operative staffs of these trades the increase was 169,400 males (4·5 per cent.) and 142,400 females (9·2 per cent.). The proportion of numbers shown in 1907 in these staffs would have been preserved in 1924 had the males been in that year more numerous, the females less numerous, by 50,000. This would appear, at first sight, to be the approximate measure in which, in the aggregate, male operatives have been displaced by females. Such a conclusion, however, ignores the fact that the organisation of the different trades involves varying proportions of males to females, and that the proportions of the trades have changed in the interval between 1907 and 1924. The maintenance, in each of the groups of trades distinguished in the preceding table, of the same proportions of male to female operatives in 1924 as in 1907, the total numbers not being altered, would have added about 144,000 to the males as compared with the numbers actually recorded, and, reducing the female total by the same figure, have shown it as practically unchanged from the first census; the entire increase being in males. This increase, representing 3¾ per cent. of the aggregate of male operatives, reflects more accurately than either the 80,000 in all occupations mentioned in the preceding paragraph or the 50,000 operatives referred to above, the extent to which the changes in industry have carried with them a relative extension of female employment.

THE PRINCIPAL INDUSTRIAL GROUPS.

In considering this conclusion, it must not be overlooked that some of the developments of the period since the First Census have afforded particular scope for the utilisation of female labour. Examples are the manufacture of cigarettes and of electric-lamp bulbs and thermionic valves. In each case a large expansion of production has occurred, and the connected increase of female operatives reported cannot be interpreted as a displacement of male operatives. The consideration of the aggregate figures without relation to details of industry, such as these, may result in misleading conclusions.

The greater part of the changes in the relative numbers of male and female operatives, and in the proportion of operatives to the total staffs, have

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

occurred in the first four of the groups of manufacturing trades distinguished in the preceding table, and it will, accordingly, be desirable to examine the figures for those groups somewhat more closely.

Iron and Steel and Allied Trades.

Taking, first, the Iron and Steel group, the following table shows the changes in the numbers employed in the principal and other trades in that group, rounded to the nearest hundred in each case:—

Iron and Steel Trades.		Operative Staff (Thousands).		Administrative, Technical and Clerical Staff (Thousands).		Total (Thousands).
		Males.	Females.	Males.	Females.	
Iron and steel (blast furnaces and smelting, rolling, and founding) ...	1924	227·1	3·1	17·3	2·8	250·3
	1907	*248·0*	*2·9*	*14·0*	*0·5*	*265·4*
Engineering (including electrical) ...	1924	410·3	47·6	66·8	22·2	546·9
	1907	*402·1*	*14·0*	*36·1*	*2·8*	*455·0*
Shipbuilding (including marine engine works at shipbuilding yards)	1924	160·2	1·0	12·7	2·6	176·5
	1907	*162·2*	*0·7*	*8·8*	*0·5*	*172·2*
Motor and cycle	1924	152·6	20·0	19·7	8·0	200·3
	1907	*41·3*	*6·0*	*5·3*	*1·0*	*53·6*
Other iron and steel	1924	226·7	64·1	31·0	8·5	330·3
	1907	*210·6*	*48·7*	*22·8*	*2·8*	*284·9*
Total ...	1924	1,176·9	135·8	147·5	44·1	1,504·3
	1907	*1,064·2*	*72·3*	*87·0*	*7·6*	*1,231·1*

Taking the Iron and Steel Group of industries as a whole, the aggregate numbers employed in 1924 were greater by 22·2 per cent. than in 1907. The proportion of females in the total employed increased from about 6½ per cent. in 1907 to about 12 per cent. in 1924, a change that is due partly to the greater utilisation of the services of females for clerical work, and partly to the development of certain industrial activities for which a female operative staff is found more suitable. Reference has already been made to the latter cause as affecting the number recorded for the Engineering Trades, where the most notable change is indicated, the number of females employed being 3·7 per cent. of all employees in 1907 and 12·8 per cent. in 1924.

The decline in the numbers of male operative staff employed in the Heavy Iron and Steel Trades and the Shipbuilding Trades, amounting to 8·4 per cent. and 1·2 per cent., respectively, of the 1907 aggregates, was not accompanied by a decrease in the small number of female operatives for which these trades provided employment. On the other hand, the development of the Motor and Cycle Trades has carried with it a small relative increase in the employment of male operatives, these forming 87·3 per cent. of all operatives employed in 1907 and 88·4 per cent. in 1924. In the "Other Iron and Steel Trades," the most important of which are those concerned in the manufacture of Hardware and Hollow-ware, Heating and Lighting Appliances, and Nails, Screws, Chains, etc., about 78 per cent. of the operative staff employed in 1924 consisted of males, as against 81·2 per cent. in 1907.

Considerable variation is shown in the proportion of Administrative, Technical and Clerical Staff employed in the Iron and Steel industries. In the Engineering Trades, where this proportion was highest, 16·3 per cent. of all persons employed in 1924 consisted of such staff; in the Motor and Cycle Trades, the corresponding figure was 13·8 per cent.; and in the Heavy Iron and Steel Trades and the Shipbuilding Trades, about 8 per cent. and 8·6 per cent. respectively. These percentage figures represent in each case an increase of the proportions returned for the year 1907; the degree of increase being greatest in the Engineering Trades, for which the 1924 figure of 16·3 per cent. compares with 8·3 per cent. only in the 1907.

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

Textile Trades.

A similar table relating to the Textile Group of trades is given below:—

Textile Trades.		Operative Staff (Thousands).		Administrative, Technical and Clerical Staff (Thousands).		Total (Thousands).
		Males.	Females.	Males.	Females.	
Cotton spinning and weaving ...	1924	181·0	320·8	13·2	2·2	517·2
	1907	*207·8*	*351·2*	*12·0*	*0·5*	*571·5*
Woollen and worsted	1924	106·7	154·8	11·5	2·9	275·9
	1907	*103·3*	*146·8*	*9·0*	*0·5*	*259·6*
Bleaching, dyeing, printing and finishing	1924	76·9	20·7	8·1	2·1	107·8
	1907	*74·4*	*17·5*	*5·7*	*0·2*	*97·8*
Hosiery ...	1924	14·9	73·8	4·7	2·6	96·0
	1907	*10·2*	*36·8*	*2·6*	*0·8*	*50·4*
Jute, hemp and linen	1924	16·8	41·7	1·8	0·5	60·8
	1907	*23·4*	*55·7*	*2·0*	*0·2*	*81·3*
Silk and artificial silk	1924	12·1	24·6	1·9	0·7	39·3
	1907	*8·6*	*21·6*	*1·2*	*0·2*	*31·6*
Lace	1924	5·6	10·2	1·7	0·6	18·1
	1907	*13·9*	*19·8*	*2·5*	*0·6*	*36·8*
Other textiles...	1924	15·7	20·0	2·9	1·0	39·6
	1907	*10·4*	*15·8*	*1·7*	*0·2*	*28·1*
Total ...	1924	429·7	666·6	45·8	12·6	1,154·7
	1907	*452·1*	*665·2*	*36·6*	*3·2*	*1,157·1*

Employment in 1924 in the Cotton Spinning and Weaving, the Jute, Hemp and Linen, and the Lace Trades declined substantially from the level of 1907, but the gross decrease was almost balanced by increases in the Hosiery, Woollen and Worsted, Bleaching, Dyeing, Printing and Finishing, Silk and Artificial Silk, and "Other" Textile Trades.

Taking the operative staff alone the aggregate numbers employed in this group declined in 1924 by about 21,000, the fall in numbers of male operatives, amounting to 22,400, being offset to the extent of 1,400 by an increase in the numbers of females.

Cotton Spinning and Weaving remained by far the most important employing trade, but its proportion of all operatives employed in this group fell from 50 per cent. in 1907 to 46 per cent. in 1924. The decrease of 57,200 in the aggregate number of operatives returned by the Cotton Trade represented 10 per cent. of the numbers employed in 1907. The Jute, Hemp and Linen Spinning and Weaving factories in Great Britain gave employment to 20,600 operatives and the Lace Trade to 17,900 operatives fewer in 1924 than in 1907, the proportion of decrease being 26 per cent. and 53 per cent. respectively. Of changes in the reverse direction, the most striking is that shown by the figures for the Hosiery Trade, in which the aggregate number of operative staff returned for 1924 exceeded by 88·6 per cent. the number on record for 1907. The increase of 21 per cent. in the numbers shown for the Silk and Artificial Silk Trades may be ascribed wholly to the development in the manufacture of Artificial Silk, though, owing to the decline in employment in the Pure Silk industry, this development is not completely expressed by the figure given. The group of "Other" trades includes the Rope, Twine and Net, the Flock and Rag, the Elastic Webbing and the Coconut, Horsehair and Feather trades. In 1924 the Packing trade was also included, and accounts for nearly three-quarters of the increase in the numbers of operatives and 70 per cent. of the increase in the total employed in the group as a whole. A not inconsiderable part of what is thus added to the "Other" trades was probably included in the Cotton Trades in 1907, the specialisation being then less marked than in 1924.

The proportion of female to male operatives in the Textile Trades slightly increased, the females numbering 59·5 per cent. of the total in 1907 and 60·8 per cent. in 1924. The number of females increased relatively to males in the Cotton, Woollen and Worsted, Jute, Hemp and Linen, Bleaching, Dyeing, Printing and Finishing, Hosiery, and Lace Trades, though only slightly in the first three of these, and in

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

the " Other " Trades, and decreased in the Silk and Artificial Silk Trades.

About 5·1 per cent. of all employees in this group of trades consisted of Administrative and Clerical Staff in 1924, as against 3·4 per cent. in 1907. The proportion of this staff was highest in both years in the Lace Trade (12·7 per cent. in 1924) and lowest in the Cotton Spinning and Weaving Trades (3 per cent. in 1924).

Clothing Trades.

In the Clothing Trades, as in the Textile Trades, the number of females employed exceeded the number of males, and, as in the Textile Trades, the proportion of females to the total employed was greater in 1924 than in 1907. The particulars for the leading trades in the Clothing group are shown in the following table:—

Clothing Trades.		Operative Staff (Thousands).		Administrative, Technical and Clerical Staff (Thousands).		Total (Thousands).
		Males.	Females.	Males.	Females.	
Clothing and millinery	1924	54·3	243·9	28·5	17·5	344·2
	1907	*67·4*	*292·4*	*23·7*	*23·5*	*407·0*
Boots and shoes	1924	82·5	48·1	13·4	3·3	147·3
	1907	*81·6*	*34·2*	*8·0*	*1·0*	*124·8*
Laundries ...	1924	20·1	87·9	3·9	6·4	118·3
	1907	*18·5*	*97·7*	*3·5*	*6·9*	*126·6*
Other clothing	1924	18·0	30·9	4·4	1·9	55·2
	1907	*20·1*	*28·8*	*3·8*	*1·3*	*54·0*
Total ...	1924	174·9	410·8	50·2	29·1	665·0
	1907	*187·6*	*453·1*	*39·0*	*32·7*	*712·4*

The Clothing group shows the most marked decrease in the interval between the First and Third Censuses of any of the groups distinguished in the general table on p. iv, the only other groups showing a decrease in total numbers being the Textile and Building and Building Materials groups, the decrease in the latter of which is confined to the Building and Contracting Trades. In the Clothing group there is not only a decrease in the dominant trade—Tailoring, Dressmaking, and Millinery—but also in the Laundry Trade and in some of the minor trades, though in these, taken as a whole, the decreases in male operatives are balanced by increases in female operatives and other classes of staff show increases in both sexes.

In each division of the Clothing group shown above, with the exception of the Boot and Shoe Trades, the number of females employed exceeded the number of males. In the miscellaneous group, which includes the manufacture of Hats, Bonnets, Gloves, Artificial Flowers and Ornamental Feathers, Umbrellas and Walking Sticks, and the treatment of Fur, females were in a majority in the first three at both dates and in the last in 1924, while the proportion of females in the Umbrella and Walking Stick Trade increased from 44 per cent. in 1907 to 47 per cent. in 1924. While in the Boot and Shoe Trade the proportion of females increased from 28·3 per cent. of the total in 1907 to 34·9 per cent. in 1924, and in the miscellaneous group from 55·7 per cent. to 59·4 per cent., in the Clothing and Millinery Trades the percentage decreased slightly (from 77·6 to 76 per cent.), and in the Laundry Trade from 82·6 per cent. to 79·7 per cent. In the latter case there was an increase in male staff, while female staff decreased, possibly owing to increasing use of power-driven machinery.

The administrative, technical and clerical staffs increased in this group in much smaller proportion than was the case in industry generally, namely, from 10·1 to 11·9 per cent. of the total employed, while the female portion of these staffs decreased in total number. This decrease was shown in the Laundry Trade and in the Clothing and Millinery Trades, the latter being responsible for the greater decrease both absolutely and relatively. The reason may be sought in the passage of garment making from being a workshop to being a factory industry, and the development of larger units of operation both in this and in the Laundry Trade.

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

Food, Drink and Tobacco Trades.

The fourth of the groups selected for particular examination is that covering the Food, Drink and Tobacco Trades. Except for Iron and Steel, Engineering, etc., this group shows the most important relative increase in females employed to be found in any of the groups shown in the table on p. iv. Both male and female operatives have increased in numbers, the former by 11,800 to 251,400, the latter by 43,800 to 161,100. As is shown in the table which follows, males were in a marked majority in most of the trades in the group at both dates, while in each of the remaining four trades there was a definite majority of females:—

Food, Drink and Tobacco Trades.		Operative Staff (Thousands).		Administrative, Technical and Clerical Staff (Thousands).		Total (Thousands).
		Males.	Females.	Males.	Females.	
(a) *Trades with a majority of females:*						
Cocoa and sugar confectionery	1924	19·2	49·2	7·0	4·1	79·5
	1907	*16·0*	*37·1*	*5·2*	*1·3*	*59·6*
Preserved meat, etc., pickles and sauces	1924	8·3	20·8	4·0	1·9	35·0
	1907	*4·2*	*6·9*	*1·6*	*0·3*	*13·0*
Fish curing...	1924	3·7	4·9	0·9	0·2	9·7
	1907	*5·9*	*18·0§*	*0·7*	*0·1*	*24·7*
Tobacco ...	1924	9·2	25·0	3·2	1·4	38·8
	1907	*8·1*	*23·2*	*3·0*	*0·4*	*34·7*
Totals of (*a*) ...	1924	40·4	99·9	15·1	7·6	163·0
	1907	*34·2*	*85·2*	*10·5*	*2·1*	*132·0*
(b) *Trades with a majority of males:*						
Grain milling	1924	24·9	1·6	6·9	1·1	34·5
	1907	*24·5*	*0·7*	*6·1*	*0·2*	*31·5*
Bread and biscuits	1924	85·5	34·5	24·1	7·1	151·2
	1907	*70·6*	*18·6*	*8·9*	*2·7*	*100·8*
Bacon curing	1924	7·7	2·9	1·9	0·6	13·1
	1907	*3·6*	*0·8*	*0·7*	*0·1*	*5·2*
Butter, cheese and margarine	1924	6·0	3·0	2·0	0·8	11·8
	1907	*3·1*	*0·9*	*1·0*	*0·1*	*5·1*
Sugar and glucose	1924	10·0	1·3	1·1	0·2	12·6
	1907	*5·7*	*0·2*	*0·6*	*	*6·5*
Brewing and malting	1924	49·2	5·2	11·3	1·4	67·1
	1907	*61·7*	*1·7*	*14·8*	*0·2*	*78·4*
Wholesale bottling	1924	8·6	6·7	3·3	0·8	19·4
	1907	*12·1*	*3·7*	*3·1*	*0·2*	*19·1*
Aerated waters, cider, vinegar, etc.	1924	9·4	4·9	3·2	0·7	18·2
	1907	*17·7*	*5·2*	*3·3*	*0·3*	*26·5*
†Other trades	1924	9·7	1·1	2·3	0·6	13·7
	1907	*6·4*	*0·3*	*1·6*	*0·1*	*8·4*
Totals of (*b*) ...	1924	211·0	61·2	56·1	13·3	341·6
	1907	*205·4*	*32·1*	*40·1*	*3·9*	*281·5*
Totals—Food, drink and tobacco	1924	251·4	161·1	71·2	20·9	504·6
	1907	*239·6*	*117·3*	*50·6*	*6·0*	*413·5*

* Less than 50.
† Viz., Spirit distilling, rectifying, compounding and methylating, the Ice trade, and the Cattle, dog and poultry food trades.
§ Some duplication is believed to be involved in this total, through the movement of staffs from station to station.

In the four trades in which females predominated, the aggregate of the female operatives numbered just over 71 per cent. of their aggregate operative staffs both in 1907 and in 1924, but while these trades accounted for 73 per cent. of the females in the Food group in 1907, they accounted for 62 per cent. only in 1924, and only about one-third of the increase of females occurred in these groups. Meanwhile, the male operatives in these groups, who numbered slightly over 14 per cent. of the male operatives in the Food Trades in 1907, numbered 16 per cent. of the 1924 total of males. In the remaining sections of the food group, decreased numbers of male operatives in such trades as Brewing and Malting, the making of Aerated Waters, Vinegar, etc., and Wholesale Bottling went far towards balancing increases in the Bread and Biscuit, Butter, Cheese and Margarine, Bacon Curing, and Sugar and Glucose Trades, with the result that the increase of males in the trades with a male majority was, in the aggregate, less than the increase in the remaining trades, though the former found employment in 1907 for six times as many males as the latter. It will be seen from the table that the proportion to the operative staff of the administrative, technical and clerical staff was lower

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

in the groups (*a*), the figures for which are given at the top of the table, than in those (*b*) shown in the lower part of the table. Fruit preserving was partly included in 1907 in the first group shown under (*a*) in the table. In 1924 it is covered by the figures in the second of those groups. Comparisons are affected by this modified allocation of Returns.

Young Persons and Adults.

An important change has taken place in reference to the proportion of employees under and over 18 years of age in manufacturing industries. For male operatives, the number under 18 years of age has fallen from 473,400 to 410,000, while for female operatives a small increase, from 389,000 to 396,000, is recorded. It will be observed that no great difference is shown between the numbers of young persons of the two sexes in industrial employment. For operatives of 18 years of age and over, the percentage of males was 73·7 in 1907 and 72·9 in 1924. The numbers increased by 232,800, or 7·1 per cent., in the case of male operatives over 18 years of age and by 135,400, or 11·7 per cent., in that of female operatives.

Controlling and Technical Staff.

The changes in the numbers of administrative, technical and clerical staffs were mainly concerned with persons over 18 years of age. So far as the numbers of these in the manufacturing trades are concerned, the males increased by 48 per cent., from 354,100 to 524,700, and the females by 150 per cent., from 56,900 to 142,100. At the First Census this class were entered under the description "Salaried Persons." The instructions given on the Schedules as to the manner in which the entries should be made were sufficiently definite, it would appear, to ensure that the interpretation aimed at was, in the main, secured. The consideration of the individual Returns for 1924 does not lend support to the supposition that the increase of numbers recorded in respect of Administrative and Clerical Staff is due in any important measure to a difference in the mode of recording persons engaged in similar tasks in the two years.

The increase of such staffs from 8 per cent. to 11½ per cent. of the aggregate of all engaged in manufacturing industry is a somewhat remarkable change. The fact that the proportion of females has increased from about 15 per cent. to about 23 per cent. appears to indicate that an increase of clerical staff is largely responsible. The increase of the practice of maintaining careful records of operations and the development of cost accounting probably explain a substantial part of the expansion of this section of the staffs of manufacturing enterprises, while, so far as it has importance, the undertaking by manufacturers, to a greater extent than formerly, of merchanting work, and work preparatory thereto, may furnish a further clue to the conditions underlying this change in the make-up of their staffs.

Changes in Industrial Distribution.

Reference was made above to changes, between the First and Third Censuses, in the relative importance of the different industries and groups of industries. The percentage distribution of males and of females employed, and of all persons together, between the manufacturing groups shown in the previous table, is shown below:—

Groups of Trades.	Males.		Females.		All employed.	
	1907.	1924	1907.	1924.	1907.	1924.
Iron and steel, shipbuilding and engineering ...	28·0	29·6	4·9	9·7	21·5	23·8
Textiles	11·9	10·7	41·3	36·4	20·2	18·3
Clothing	5·5	5·1	30·0	23·7	12·4	10·5
Food, drink and tobacco	7·1	7·2	7·6	9·8	7·2	8·0
Paper and printing ...	5·0	5·0	6·4	6·8	5·4	5·5
Timber	4·7	4·1	1·3	1·8	3·8	3·4
Building and building materials	16·1	14·0	2·5	3·1	12·2	10·8
Public utilities	14·1	16·1	0·3	0·6	10·2	11·6
Other groups	7·6	8·2	5·7	8·1	7·1	8·1
Total	100·0	100·0	100·0	100·0	100·0	100·0

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

The above table relates to trades other than those in the Mining and Quarrying group, and the total numbers covered by the table were greater in 1924 than in 1907 by 10 per cent. (see table on p. iv). The "Mines and Quarries" group accounted for 14·3 per cent. of all employed in 1907 and 17·1 per cent. in 1924. The numbers of females in this group were almost negligible; the proportion of male operatives relatively to the total of males in all groups rose from 20 per cent. in 1907 to 24·5 per cent. in 1924.

Of the changes shown, those affecting the distribution of females are the most striking. Textiles and Clothing, even without allowance for any small workshops from which particulars were not obtained in 1907, accounted for over 70 per cent. of the total of females in 1907 and for 60 per cent. only in 1924. The total number of females employed in these groups decreased from 1,154,200 to 1,119,100, while in the other groups the total increased from 463,200 to 740,200, of which totals 30,800 and 124,500 respectively represented administrative, technical and clerical staffs. Of the groups showing increased percentages of the total numbers employed, the smallest proportionate increase is registered in the group of Paper and Printing Trades, where the numbers increased by about 13 per cent. Taking both sexes together, the relative importance of the Miscellaneous group has increased proportionately more than that of any of the other eight with which the table deals. Of the groups more definitely indicated, Public Utilities, with which the production in Government establishments has been grouped, show the largest proportional increase in relative importance, and the Iron and Steel group follows next in order. In the former case the extension of the work of Local Authorities and the increased use of electricity have a notable influence on the growth shown, and in the latter the expansion of the motor-car industry and the increasing need for electrical equipment, both for generation, distribution, and use, have together been of greater importance than the decreased activity in Shipbuilding and in the Iron and Steel Trades in the narrower sense.

Of the cases of decreased relative importance, as employing male labour, Building and Building Materials stands out, though the Timber group shows as great a proportionate decrease in its percentage figure. In the matter of male employment afforded, as compared with that shown for 1907, the Textile group occupied in 1924 a relative position not quite as unfavourable as in the case of female employment, and in Clothing the figures for males show notably less proportionate decrease between the two dates than those for females. The Clothing group shows the largest total decrease in numbers employed, and the decreased relative importance of the Textile group is consistent with a total number, employed in 1924 in all the trades included in that group, differing only by a small fraction of 1 per cent. from the total number recorded for 1907.

New Values Created in Industry.

The totals recorded in the Returns to the Census of Production Office amount to the following:—

	1907. Million £.	1924. Million £.
Gross Output	1,698.2	3,853.1
Cost of materials and of work given out to be done on goods	1,009.1	2,155.6
Net output	689.1	1,697.5

As the output of some firms consists largely of goods serving as materials which other firms work up, the totals in the first line of the above statement include considerable sums duplicated in the second line. The figures in the third line are clear of duplication, and represent the values resulting from the operations

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

of industry out of which wages and salaries and all expenses such as rent, royalties, rates, taxes, depreciation, sales expenses, and all similar charges have to be defrayed, as well as profits.

EXTENT OF PRICE CHANGES, 1907-24.

Direct comparison of the aggregates shown above for Net Output in 1907 and 1924 does not furnish a measure of the quantum of the productive services rendered. The extent to which these aggregates are affected by the different ranges of prices at which goods were disposed of and materials acquired is not known with any exactitude. The general index number of wholesale prices prepared by the Board of Trade was compiled on different principles before and after 1920. The older method furnishes a measure of wholesale price movement between 1907 and 1913, the revised index number furnishes a measure from 1920 onwards. For the movement between 1913 and 1920 the indications of the two series of calculations are not entirely in agreement. For the whole period the rise of prices is calculated at 83 per cent. if the earlier procedure is followed to 1920, and at 88 per cent. if the earlier procedure is used only for the movement to 1913, the changes from that date being measured by the revised index number. The difficulties of measurement over the period 1913 to 1920 are very great, and different enquiries have reached different results for this period, even when for periods less disturbed their calculations are consistent.

The index numbers of wholesale prices are based, in the main, on the movements in the prices of standard grades of materials, not on those of the prices of finished products, and there is reason to believe that, at any rate in comparison with 1913, the prices of finished products have risen more than those of the materials of which they are made. The price movements shown in the records of our export trade, regarding which the Board of Trade have published data for the period 1900 to 1913, and also for 1919 and later years based on comparisons with 1913, indicate that, in the interval between 1907 and 1913, prices of goods as exported advanced on the average by a smaller percentage than the indices of wholesale prices reflect. The old Board of Trade index number of prices shows an advance of 10 per cent. between 1907 and 1913, while the average change shown in the computations relative to our export trade was an advance of under 4 per cent. From 1913 to 1924 the wholesale prices index shows a rise of 66 per cent., the export trade valuations a rise of 89 per cent. Over the entire period, the export trade valuations show a rise of 96 per cent. in the average values of the goods shipped. Owing to the different movements of prices for different classes of commodities, while the relative importance of various groups of goods in our export trade on the one hand and in our general manufacturing industry on the other are by no means the same, the direct application of such a measure of price movements to the figures obtained from the Census would be of doubtful propriety. It is suggested by calculations made from a number of trades in which quantity data were obtained in the Census Returns that the average advance in prices of products between 1907 and 1924 was in the near neighbourhood of 100 per cent.

In these calculations relating to price changes, both in the export trade and in the output of industry, any change in quality or grade of goods having the same general description will affect the calculated results. If, as is thought probable, there has been a general improvement in the quality or grade of goods similarly described in 1907 and in 1924, the apparent change in prices will be greater than that which would express truly the price changes of goods of similar quality at both dates. It is, however, not possible to determine how great the average change in quality has been in cases in which there has been no change in the description of the goods.

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

The money value of the Net Output in 1924 was greater than that returned for 1907 by over 146 per cent. The exclusion of 14 millions in 1907 and 93 millions in 1924, representing excise duties covered in certain cases by the valuation of goods produced but not included in the cost of materials, reduces this percentage to about 128. If the average rise in prices be taken as 100 per cent., the Net Output represents a larger mass of finished goods in 1924 than in 1907, the excess being about 19 per cent. The numbers employed in producing these Net Outputs were greater in 1924 than in 1907 by 13·8 per cent., and, while the proportion of females increased in some degree, as shown above, the proportion of persons below 18 years of age decreased. If, when the effects of price differences are eliminated, the Net Output per head was as great in 1924 as in 1907, the net effect of the price changes cannot have been greater than that arising from a uniform increase of about 109 per cent. in prices. The examination of the information available in the Schedules and elsewhere, in the course of the preparation of the Final Report, may provide some more definite measure than is at present available as to the extent of the price changes of which account must be taken in any quantitative estimate of the change in Net Output per head. At present it does not appear possible to make any statement more definite than that a small quantitative increase of Net Output per head appears to be indicated. The changes in prices generally between the two dates under consideration, and the changes in the course of the Census Years themselves, combined with the absence of information in many cases, especially at the First Census, regarding the quantities of goods produced, render difficult any reliable determination of this point. Apart from the lack of quantitative information from remediable causes, the nature of the goods produced, in some important cases, is such as renders impracticable their expression in numbers of standard units of quantity.

INDUSTRIAL VARIATIONS AND CHANGES.

The examination of the figures obtained by dividing the aggregate Net Output for an industry or group of industries by the total number of persons engaged in the industry or group furnishes some interesting average results shown in the table below. It should be borne in mind that, when a large proportion of females is included in the persons engaged in the work of any industry, there is, generally speaking, a smaller Net Output per head than when the proportion of females is small, while in cases in which a heavy expenditure on advertising is borne by manufacturers a large Net Output per person employed is commonly recorded.

Groups of Trades.	Net Output, 1907.		Net Output, 1924.		Col. (4) as a percentage of Col. (2).
	Total.	Per Person employed.	Total.	Per Person employed.	
	(1) £ million	(2) £	(3) £ million	(4) £	(5)
Mines and quarries ...	118·0	123·7	229·9	177·4	143
Iron and steel, shipbuilding, engineering, etc.	130·0	105·6	299·7	199·3	189
Textiles	88·8	76·7	205·4	178·0	232
Clothing	45·4	63·7	103·4	155·6	244
Food, drink and tobacco	66·4	160·4	187·0	370·6	231
Paper and printing ...	32·1	104·1	94·0	269·4	259
Timber	17·9	83·1	40·7	188·8	227
Building and building materials	58·8	83·8	141·4	207·4	248
Public utilities ...	65·1	110·8	162·5	222·2	200
Other trades	52·6	129·3	140·5	275·1	213
Total	675·1	100·9	1,604·5	210·8	209
Total, *without mines and quarries* ...	557·1	97·2	1,374·6	217·6	224

Note.—The following deductions have been made on account of Excise duties: From the Food Group, £89,920,000 in 1924 and £13,953,000 in 1907; from the "Other Trades" Group, £3,086,000 in 1924 only.

In calculating the figures in columns (1) to (4) the appropriate deductions have been made in cases in

which the Value of Output included duties not also included in the Cost of Materials, so as to reduce the figures for all groups to a better basis of comparison.

The Food, Drink and Tobacco Group, in 1924 as in 1907, shows the largest net output in proportion to the persons employed, the proportionate increase in the money value of the net output per head being somewhat greater than for the manufacturing industries as a whole. The Paper and Printing Group, including the printing and publication of newspapers, shows the largest proportional increase. It is to be remembered that persons not on the regular staffs of newspapers are not included in the total which is used as a divisor in calculating the net output per head, even though they may be solely engaged in providing material for the columns of newspapers. Thus the news-collecting staffs of news agencies are not included in this, or in any, group of the Census. Whether any change in the proportion of these and other external staffs to the total engaged in newspaper production has taken place in the interval, of an importance that can account for the relative increase in net output, cannot be determined from the Census records. It may be observed, however, that for the Printing and Publication of Newspapers the figures of net output per person employed were £190 in 1907 and £546 in 1924. The increase of newspaper advertising probably contributed to this notable increase. Information regarding the proportion of income from advertisements and from sales was not furnished in connexion with the Census Enquiry.

The Mining and Quarrying Group contributed 17·5 per cent. of the aggregate net output (after deduction of excise duties) in 1907 and 14·3 per cent. in 1924. The numbers engaged in this group, as shown above, were 14·3 per cent. of the aggregate for all trades in 1907 and 17·0 per cent. in 1924. Thus the average net output per person employed showed a much smaller percentage increase in this Group than for all trades together. In a less degree a similar situation is shown for the Group of Iron and Steel trades, including engineering, etc. As shown in a preceding table (p. vii), the numbers in this Group were 21·5 per cent. of all engaged in the manufacturing trades in 1907 and 23·8 per cent. in 1924. In 1907 this Group contributed 23·3 per cent. of the net output of the manufacturing trades (less excise duties) and, in 1924, 21·9 per cent. of the corresponding total. The net output per person employed was thus 8·6 per cent. higher than that of all manufacturing trades in 1907 and 8·5 per cent. lower in 1924.

In the Timber Trades Group, which includes furniture making and carriage building, the average net output per head of persons employed was 14·5 per cent. below the general average for manufacturing trades in 1907, and 13 per cent. below the corresponding figure in 1924. The Public Utilities Group, for the major part of which the net output includes no provision for profit, the Returns being on a cost basis, the average net output was in excess of that for all manufacturing trades at both dates, but approached the general average more closely in 1924 than in 1907. In the Building, Textile, and Clothing Groups the net output per head was, in varying degrees, below the average for all manufacturing industries at both dates, but the deficiencies were less in 1924 than in 1907. In all three cases, as well as in the Timber group, the numbers of persons employed, as reported for 1924, were lower than in 1907, while all the other groups distinguished in the table showed increases in the totals employed.

The figures of the last table suggest a certain amount of levelling up, in the interval between 1907 and 1924, in the net output per person employed, particularly in those groups in which the 1907 figures were lowest. In the group with the lowest figures at both dates, the Clothing Trades Group, the 1907 figure was 34½ per cent. below the general figure for the manufacturing trades, while the 1924 figure was about 28½ per cent. below the general average. In the group with the highest figures, the Food Trades Group, the 1907 figure was higher than the general average by 65 per cent., and the 1924 figure by 71 per cent.

CHANGES WITHIN LEADING GROUPS.

In view of the considerable divergencies in movement in different groups of industries, it appears desirable to examine the movements in the principal trades included in the more important groups, for which the changes in numbers employed were examined in an earlier section of this review (see pp. iii to vii).

Iron and Steel and Allied Trades.

The Iron, Steel, Engineering, etc., Group contributed the largest net output in 1924, as in 1907. A table showing the changes which occurred in net output per person employed in the principal industries covered by this group is given below:—

Iron and Steel Trades.	Net Output, 1907.		Net Output, 1924.		Col. (4) as a percentage of Col. (2).
	Total.	Per Person employed.	Total.	Per Person employed.	
	(1) £ million	(2) £	(3) £ million	(4) £	(5)
Iron and steel (blast-furnaces and smelting, rolling, and founding works) ...	30·75	115·8	50·92	203·4	176
Engineering (including electrical)	49·99	109·9	110·52	202·1	184
Shipbuilding (including marine engine works at shipbuilding yards)	17·26	100·3	28·76	162·9	162
Motor and cycle ...	5·88	109·6	45·33	226·3	206
Other iron and steel ...	26·14	91·7	64·17	194·3	212
Total	130·02	105·6	299·70	199·3	189

The average net output per person employed in this group of trades was 8·5 per cent. below the general average of all manufacturing industries in 1924, a feature which becomes more significant when the relatively small proportion of females employed in these trades (nearly 12 per cent.) is compared with the proportion employed in manufacturing industry generally (29·4 per cent.). In 1907, the net output per head in the Iron and Steel group of trades exceeded the average of all manufacturing trades by about 8·6 per cent. The low figures recorded for 1924 in the Heavy Iron and Steel Trades, the Engineering, and, most notably, the Shipbuilding Trades, illustrate the effect of short time and irregular working on the net output per person employed. The increased importance of the Motor and Cycle industry is indicated by a comparison of the figure of 4·5 per cent. for 1907, representing the proportion which the net output of this industry formed of the aggregate for the whole group of Iron and Steel trades in that year, with the corresponding figure of 15·1 per cent. for 1924.

Textile Trades.

The results for the Textile group of trades are given below in similar detail:—

Textile Trades.	Net Output, 1907.		Net Output, 1924.		Col. (4) as a percentage of Col. (2).
	Total.	Per Person employed.	Total.	Per Person employed.	
	(1) £ million	(2) £	(3) £ million	(4) £	(5)
Cotton spinning and weaving	44·98	78·3	82·38	159·3	203
Woollen and worsted ...	18·35	70·7	51·73	187·5	265
Bleaching, dyeing, printing and finishing	10·07	103·0	27·04	250·8	243
Hosiery	3·10	61·4	15·23	158·6	258
Jute, hemp and linen ...	5·05	62·1	8·54	140·3	226
Silk and artificial silk	1·73	54·6	9·98	254·5	466
Other textiles ...	5·50	84·8	10·48	181·7	214
Total	88·78	76·7	205·38	177·9	232

A noteworthy change is shown in the figures for the Silk and Artificial Silk Trades, in which the net out-

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

put per head of persons employed was the lowest (£54·6) of all the specified trades in 1907 and the highest (£254·5) in 1924. The effect of the development of the manufacture of artificial silk on the results for these trades has already been referred to. The value of the net output of these trades in 1924 was a little over five and one-half times that recorded for 1907. Another point of interest is the increase in the net output of the Hosiery Trade, which constituted 7·4 per cent. of the aggregate for the group as a whole in 1924, against 3·5 per cent. in 1907. The net output of the Cotton Trade, which in 1907 formed a little more than one-half of the group aggregate, declined to about 40 per cent. in 1924, while the share of the Woollen and Worsted Trades increased from 20·7 per cent. in 1907 to 24·1 per cent. in 1924.

The Jute, Hemp and Linen Trades, which in 1907 exceeded both the Silk and the Hosiery Trades in magnitude of net output, fell below both of these trades in 1924, and occupied only the sixth position of importance in this respect. The combined effect of a preponderance of female labour and the element of short time is seen in the low net output per head shown for these trades, and also for the Cotton Spinning and Weaving Trades.

Clothing Trades.

For the Clothing Trades the following analysis shows the consistent advance in net output per head in different branches:—

Clothing Trades.	Net Output, 1907.		Net Output, 1924.		Col. (4) as a percentage of Col. (2).
	Total.	Per Person employed.	Total.	Per Person employed.	
	(1) £ million	(2) £	(3) £ million	(4) £	(5)
Clothing and millinery	25·54	62·7	52·14	151·5	242
Boots and shoes ...	8·87	71·1	25·03	169·9	239
Laundries	6·98	55·2	16·08	135·9	246
Other clothing ...	4·02	74·6	10·20	184·8	248
Total	45·41	63·6	103·45	155·6	244

Food, Drink and Tobacco Trades.

In the Food, Drink and Tobacco Trades the variations from trade to trade were, as the following table shows, on the whole, similar at both the dates compared. Outstanding exceptions are the Tobacco Trade, with a high ratio of advance in net output per head, and the Grain Milling Trade, with a low ratio of advance in this respect. The defect referred to on an earlier page, which affects the figures of the Fish Curing Trade in 1907, deprives of significance the arithmetical calculation of the ratio of increase in net output per head:—

Food, Drink and Tobacco Trades.	Net Output, 1907.		Net Output, 1924.		Col. (4) as a percentage of Col. (2).
	Total.	Per Person employed.	Total.	Per Person employed.	
	(1) £ million	(2) £	(3) £ million	(4) £	(5)
Cocoa and sugar confectionery	5·04	84·6	17·13	215·5	255
Preserved meat, etc....	1·86	143·1	11·63	332·3	232
Fish curing	0·75	30·6*	1·80	185·4	606*
Tobacco	5·54	159·7	23·94	617·0	386
Grain milling	5·75	182·6	11·76	340·7	187
Bread and biscuits ...	10·56	104·8	38·48	254·4	243
Bacon curing	0·84	163·2	4·42	337·2	207
Butter, cheese and margarine	0·81	159·2	4·50	382·8	240
Sugar and glucose ...	1·10	168·7	6·11	484·2	287
Brewing and malting	25·94	330·9	45·70	681·4	206
Wholesale bottling ...	3·00	156·9	8·95	461·7	294
Aerated waters, cider, etc.	3·33	125·5	5·75	315·7	251
Other trades	1·93	229·8	6·88	502·8	219
Total	66·45	160·4	187·05	370·6	231

* See note to Table on p. vi.

EMPLOYMENT IN ENGLAND AND WALES AND IN SCOTLAND.

The following tables show, for England and Wales and for Scotland separately, the principal particulars dealt with in the preceding pages for Great Britain as a whole.

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

SUMMARY OF PARTICULARS OF PERSONS EMPLOYED AND NET OUTPUT, 1924.

ENGLAND AND WALES.

Groups of Trades.	Operative Staff.		Administrative, Technical and Clerical Staff.	Net Output.	
	Males.	Females.		Total.	Per Person employed.
	Thou.	Thou.	Thou.	£ million	£
Mines and quarries ...	990·1	0·9	22·4	177·7	175·3
Iron and steel, shipbuilding, engineering, etc.	1,017·7	128·8	167·9	263·3	200·3
Textiles	391·2	580·0	51·3	181·7	177·7
Clothing	163·2	379·7	71·8	96·8	157·5
Food, drink and tobacco	217·5	138·1	81·0	247·5*	567·1*
Paper and printing ...	162·6	96·3	49·2	84·1	273·1
Timber	130·2	23·1	27·9	34·1	188·1
Building and building materials	509·0	44·5	66·2	129·7	209·3
Public utilities ...	601·0	5·5	57·4	146·8	221·1
Other trades	272·5	117·8	74·2	130·1*	280·1*
All trades	4,455·0	1,514·7	669·3	1,491·9*	224·7*
Totals, excluding mines and quarries ...	3,464·9	1,513·8	646·9	1,314·3*	233·6*

SCOTLAND.

Groups of Trades.	Operative Staff.		Administrative, Technical and Clerical Staff.	Net Output.	
	Males.	Females.		Total.	Per Person employed.
	Thou.	Thou.	Thou.	£ million	£
Mines and quarries ...	272·1	4·8	5·4	52·3	185·2
Iron and steel, shipbuilding, engineering, etc.	159·2	7·0	23·7	36·4	191·6
Textiles	38·5	86·6	7·1	23·7	178·9
Clothing	11·7	31·1	7·5	6·6	131·7
Food, drink and tobacco	33·9	23·0	11·1	29·4*	432·7*
Paper and printing ...	19·5	15·1	6·4	9·9	241·7
Timber	25·1	4·6	4·7	6·6	192·6
Building and building materials	52·5	2·3	7·3	11·7	188·3
Public utilities ...	60·6	0·4	6·3	15·7	233·1
Other trades	30·9	9·2	6·2	13·4*	289·4*
All trades	704·0	184·1	85·7	205·7*	211·2*
Totals, excluding mines and quarries ...	431·9	179·3	80·3	153·4*	221·9*

* These totals are inclusive of excise duties in certain cases, separate particulars of the amounts charged in England and Wales and in Scotland not being published.

The Power Equipment of Industry.

As will be seen from the following comparative table, the mechanical power available at mines and in factories and works in Great Britain, to which the particulars given in the preceding sections of this review relate, showed a large increase between 1907 and 1924.

PRIME MOVERS (Thousand Horse-Power).

Kind of Engine.	1907.	1912.	1924.		
			Ordinarily in use.	In reserve or idle.	Total.
Steam:					
Reciprocating ...	8,981	8,624	6,987	1,313	8,300
Turbine	523	1,450	5,304	1,415	6,719
Internal combustion:					
Gas	657	698	741	193	934
Light oil		53	85	12	97
Heavy oil			138	27	165
Total, internal combustion ...	657	751	964	232	1,196
Other	213	124	185	19	204
Total	10,374	10,949	13,440	2,979	16,419
Total, excluding electric supply stations ...	8,842	8,875	9,210	1,828	11,037

The last line of the table shows the total engine power reported for factories and works other than the generating stations of Electricity Supply Undertakings. In addition, there were shown in the Returns for 1924, made in respect of these factories and works, electric motors driven by purchased electricity the total capacity of which amounted to 4,557,000 horse-power, including 627,000 horse-power reported as in

reserve or idle. In connexion with the First Census corresponding particulars were not obtained, the information then secured relating to the total quantity of electricity purchased, whether used for lighting, for heating, or for power. It is, accordingly, of importance to note that at the Second Census (1912) the Returns showed that electric motors driven by purchased electricity were installed at factories and works (other than those of Electricity Undertakings), the total capacity of which amounted to 941,000 horse-power. This total was not exhaustive, and may have been inaccurate in some degree, since the revision and completion of defective Returns was not in all cases carried out. The total, like other aggregates derived from the Returns for 1912, was further defective owing to the exemption of certain trades from the obligation to furnish any particulars in connexion with the Second Census. The most important of these were the Building and Contracting Trades, and in the group of which these form the most important part the effect of the exemptions is most plainly marked. In other groups the omissions from this cause were not of outstanding importance.

The capacity of the Engines reported by the Building and Contracting Trades in 1907 amounted to 167,000 horse-power and in 1924 to 99,000 horse-power. In the latter year 92,000 horse-power was the aggregate capacity of the electric motors driven by purchased electricity, while in 1907 the total electric energy purchased was returned as slightly under 6 million Board of Trade units. These figures furnish some indication of the direct effect of the exemption of the Building and Contracting Trades in 1912, but they need to be supplemented by the corresponding results of the extension of the exemption to the building and constructional work carried out by Local Authorities and other Public Utility Undertakings.

It would appear that the capacity of the electric motors driven by purchased electricity was in 1924 more than four times the horse power of all such motors existing in 1912 in the entire field covered by the later enquiry, and it may be regarded as certain that the aggregate capacity of the electric motors driven by purchased electricity in 1907 was less than 1,000,000 horse-power, and probable that it was substantially less than this figure. At the First Census, the total of electricity purchased by industrial enterprises other than generating stations was about 440,000,000 kilowatt-hours, or about one-third of the aggregate output of generating stations producing electric energy for sale in that year. The corresponding proportion of the engines installed at such stations represents about 500,000 horse-power capacity. As the figure cited relating to purchased current includes supplies for lighting and heating as well as for power, the conclusion that the motors driven in 1907 by purchased electricity were of an aggregate capacity considerably less than 1,000,000 horse-power appears to be supported by this comparison of the data available.

INCREASE IN TOTAL MECHANICAL POWER.

For a comparison of the total mechanical power available in industrial establishments at the dates of the three Censuses, it is necessary to take account of the class of motors driven by purchased electrical energy. In making such comparisons, however, consideration must be given to a factor the importance of which cannot be judged from the figures summarised in the preceding table and comment, namely, the proportion of the working time of any establishment during which mechanically-driven and electrically-driven machinery respectively are utilising the power which is available, and the economy in the use of power arising from the employment of electric motors in cases where the need for power is intermittent. Further, while the engines and motors installed, which were idle or in reserve, represented probably a larger fraction of the total capacity in 1924 than was the case in 1907 or 1912, no information is available for the purpose of measuring the difference.

In 1924,* of the total electricity generated at and supplied by public generating stations, over 40 per cent. was returned as for power and manufacturing purposes, while about a quarter of the total was for purposes not separately distinguished. The total thus recorded as sold for power and manufacturing purposes in 1924 was about 4½ times the total of the 1907 purchases by industrial and mining firms and companies as cited above. The proportion of the engine capacity in use at the stations which corresponds to the supply known to have been for power and manufacturing purposes in 1924 is roughly 1,750,000 horse-power, and this may be taken as the minimum of the power used in that year for the supply of industrial and mining establishments.

If (in order to avoid duplication) the power equipment of the electric generating stations be left out of account in the totals for both Censuses, except in so far as it was used to provide industrial power, the particulars given above provide the following approximate data for comparison of the mechanical power available to industry other than these generating stations. In 1907 the total was little, if at all, over 9,000,000 horse-power. In 1924 the total ordinarily in use was not less than 11,000,000 horse-power, to which should be added some part of a further 1,000,000 horse-power used in supplying electricity for purposes which may have been industrial, though not specifically so described. As the 9,000,000 includes power in reserve in 1907, the proportion of increase is greater than appears from the totals as thus stated. The power capacity in reserve or idle in 1924 was about 1,800,000 horse-power, together with such part of the reserve or idle capacity of the Electric Supply Stations (1,150,000 horse-power) as may be considered as available for supplies to industry.

Taking these figures in the mass, they represent an increase in the mechanical power per head amounting to not less than 7½ per cent., and possibly to as much as 40 per cent. If the idle and reserve plant included in the 1907 figures were taken into account, the minimum estimate of the proportion of increase would be raised in correspondence with the importance of such plant.

INCREASE IN ELECTRICAL POWER.

Though this aspect of the figures appears to suggest a possibly only moderate advance in the provision of mechanical equipment in industry, there are other facts revealed by the records which show a change of remarkable extent in the manner of applying the power used. The lack of particulars regarding the use of electric motors driven from dynamos at the factories or works in 1907 prevents a direct comparison of such motors in 1907 and 1924, as a like comparison of motors driven by purchased electricity fails for lack of data. The capacity of electric generators installed at the factories or works was, however, returned at both dates, and compare as follows, the figures for 1912 being added for comparison, though incomplete, as in the case of Prime Movers.

ELECTRIC GENERATORS. (Thousand Kilowatts.)

Driven by :—	1907.	1912.	1924.		
			In Use.	In Reserve.	Total.
Steam engines :					
Reciprocating ...	1,251	1,407	845	430	1,275
Turbine	346	1,019	3,811	1,000	4,811
Internal combustion engines :					
Gas	107	275	164	84	248
Light oil			6	3	9
Heavy oil			60	14	74
Other power			83	7	90
Total	1,704	2,701	4,969	1,538	6,507
Total, excluding electric supply stations ...	702	1,247	1,847	717	2,564

* See Preliminary Reports, No. 24, Board of Trade Journal 6th October, 1927.

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

Two features of this table, and of its comparison with the earlier table relating to engine power (p. x), are of particular importance and are especially clear. The first is the smallness of the change between 1907 and 1924 in the total of reciprocating engines and the large increase of steam turbines, and the connexion of this change with the conversion of mechanical power into electricity for convenience in transmission to the point of use. In 1907, about one-fifth of the power of the reciprocating steam engines installed would be needed for the dynamos having that type of drive. In 1912 and in 1924 (all generators, including reserves) the corresponding percentage was a little higher. In all three years the steam turbines recorded corresponded closely with the power required for driving the dynamos having that type of drive. While in 1907 only about 5 per cent. of the engine power was derivable from steam turbines, and in 1912 about 13½ per cent., in 1924 about 39½ per cent. of the engine power ordinarily in use and nearly 41 per cent. of all that recorded, including engines in reserve or idle, was derivable from steam turbines. The steam turbines in reserve or idle represented 47½ per cent. of the total engine power in reserve or idle.

The increase in the proportion of steam turbines to the total power available is thus significant of the increased use of electric power in industry. Of power not derived from steam, representing somewhat over 8 per cent. of the total mechanical power in 1907, in 1912 and in 1924, about one-sixth in 1907 would be needed for dynamos so driven, and something like 40 per cent. in 1912 and in 1924.

A second point of importance in the same connexion is the increase, not only of the use of purchased electricity to provide motive power, as already noted, but of the capacity of dynamos at the factories and works, excluding the public supply stations. The total capacity in 1924 was over 3½ times that in 1907 and double that covered by the 1912 record, and the capacity of the dynamos ordinarily in use in 1924 was over 2½ times that of all the dynamos installed in 1907, whether in use or in reserve. Even the capacity in reserve or idle in 1924 was as great as the total capacity available in 1907. It will be noted that the electric supply stations had only 21 per cent. of their capacity in reserve or idle in 1924, while other establishments covered by the table had 28 per cent. of the capacity of their dynamos in reserve or idle.

If account is taken of the fact that the dynamos at the factories and works are in part used for the supply of current for lighting and heating, the ratio of increase of electrically-driven plant is, possibly, increased. What proportion of the capacity was needed in 1907 or 1912 for purposes other than power is not known. For 1924 it is anticipated that the voluntary information received will throw light on this point. In 1912 the capacity of the electric motors in the establishments covered by the Second Census which were driven from dynamos in those establishments was 1,451,000 horse-power (including 151,000 horse-power at electric supply stations), or at the rate of 10 horse-power driven from their own dynamos to each 7 horse-power driven by purchased electricity. It is impossible to determine whether in 1907 the ratio was similar to that of 1912, but it is practically certain that the total capacity in 1907 was much smaller than that of 1912.

AGGREGATE POWER FOR 1907 AND 1924 COMPARED.

Comparing the aggregate power equipment of all undertakings other than Electric Supply Stations, the position in 1907 was that, in addition to dynamos requiring about 1,000,000 horse-power to drive them, and the engines furnishing that power, together with motors driven by purchased electricity of a total capacity less, and probably considerably less, than 1,000,000 horse-power, mechanical power of about 7,750,000 horse-power was available, inclusive of reserve or idle power equipment. In 1924 the dynamos ordinarily in use would require about 2,500,000 horse-power to drive them, and the motors driven from them were of an aggregate capacity of 2,885,000 horse-power: motors ordinarily in use driven by purchased electricity had a total capacity of 3,930,000 horse-power: in addition, mechanical power of about 6,500,000 horse-power was ordinarily in use, while 1,828,000 horse-power was in reserve or idle, over 1,000,000 of which would be needed to actuate the dynamos in reserve or idle, if these were brought into use without displacing plant already active. Thus, the power ordinarily in use and applied mechanically in 1924 was less by about one-sixth than that available, whether ordinarily in use or not, in 1907, and the dynamos ordinarily in use in 1924 required over 1,500,000 horse-power more to drive them than did the dynamos available, whether in use or not, in 1907. In addition to the power applied mechanically, electric motors were ordinarily in use in 1924 of an aggregate capacity of 6,815,000 horse-power, a total of which the entire equipment of electric motors in 1912 was less than one-third, and in 1907 probably much less than in 1912. The power applied mechanically had decreased by much less than the increase of the power applied electrically. Since, however, the continuity of use of electric power and of mechanical power may differ, and differ widely, no precise comparison of the aggregate power equipment of 1907 and that of 1924 is possible, apart from the uncertainty regarding the difference between 1907 and 1924 in the matter of the proportion of the total equipment that was in reserve or idle. In some cases it appears probable that power plant not ordinarily in use in 1924, while held in reserve and not dismantled, is unlikely to be brought into use again. What proportion these cases bear to those in which the plant was idle for lack of orders, and how far the position in 1907 was similar or dissimilar in respect of plant existing unused, the available information is insufficient to show.

The data show clearly that a large development of electrically driven machinery has taken place. Even if the exemptions of 1912 were assumed to affect only to a negligible extent the total figures of capacity of electric generators, this capacity at establishments other than Electric Supply Stations increased at an average rate of 12 per cent. per annum between 1907 and 1912, and at an average rate of rather over 6 per cent. per annum in the following 12 years. The capacity of the generators at Electric Supply Stations increased at the average rate of 7·7 per cent. per annum between 1907 and 1912, and at the average rate of 8·6 per cent. per annum between 1912 and 1924. Even if the reserve plant of 1912 be ignored, the rate of increase, comparing total capacity of generators in 1912 with capacity ordinarily in use in 1924, was 6·6 per cent. per annum. As shown in a subsequent table, the total capacity of all electric motors recorded, other than those at Electric Supply Stations, was 2,246,000 horse-power in 1912, and 7,942,000 horse-power in 1924, and though, owing to the omissions from the 1912 record, this somewhat exaggerates the expansion, the average rate of 11 per cent. per annum is still significant of rapid expansion, as is the similarly calculated figure of 14 per cent. per annum for the increase in capacity of motors driven by purchased electricity (from 941,000 horse-power to 4,557,000 horse-power).

Any general survey of the figures relating to power equipment in different industries will, it is thought, gain so much from the use of the additional particulars obtained in response to the voluntary questions relating to the fuel used that it may profitably be deferred until the results of the complete examination and collation of those particulars are available. The following table gives, however, the aggregate figures for the total horse-power of engines at the factories and works in the principal groups of trades and of the capacity of electric-generating plant installed, both for 1907 and for 1924. The figures relate to Great

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

Britain only for both years. In some degree the separation into groups results in a misrepresentation of the power applied for operating machinery in the several groups. Only a few of the groups are, however, affected to an extent that calls for caution in applying the results of the tabulation. In some cases power generated at establishments shown in the first group in the table was supplied for use at establishments included in the sixth group. Some transfers also occurred between the first two groups, though it is within the second group that the more important transfers from trade to trade occurred.

POWER EQUIPMENT IN INDUSTRIAL GROUPS.
1907 AND 1924.

Groups of Industries.	Prime Movers (exclusive of Locomotives).			Electric Generators.		
	1907.	1924.		1907.	1924.	
	Total H.P.	Total H.P.	H.P. in reserve or idle.	Total Capacity.	Total Capacity.	Capacity in reserve or idle.
	Thou. H.P.	Thou. H.P.	Thou. H.P.	Thou. K.W.	Thou. K.W.	Thou. K.W.
Mines and quarries ...	2,467	3,321	456	111	839	236
Iron and steel, engineering, shipbuilding, etc.	2,085	2,645	651	246	663	219
Textiles	1,894	2,218	220	77	273	42
Food, drink and tobacco	325	347	59	26	77	25
Paper and printing ...	227	291	42	26	93	28
Building and building materials	423	404	51	20	79	20
Public utilities: Electric supply ...	1,532	5,382	1,151	1,002	3,943	821
Other	782	950	167	123	257	52
Other trades	639	861	182	73	283	95
Total	10,374	16,419	2,979	1,704	6,507	1,538

The increase of prime movers at Electric Supply Undertakings, as already noted, accounts for the major part (63·7 per cent.) of the total increase shown in the table, and of the remainder the three groups first named in the table account for four-fifths, these groups having, in 1907, 73 per cent., and, in 1924, 74 per cent. of the horse-power other than that at Electric Supply Stations. Apart from Electricity Undertakings, the largest absolute increase is shown for the Mines and Quarries group, which had also the largest relative increase of any of the groups separately shown, though the miscellaneous trades included in "Other Groups" showed nearly as large a relative expansion of power equipment. The Iron and Steel group came next to Mines and Quarries in the absolute increase of engine power, and the Textile group accounted for the third largest increase. The total horse-power recorded as in reserve or idle in 1924, averaging for all trades 18 per cent. of the power installed, is also shown in the table. It may be noted that the total horse-power of prime movers returned for 1912 was 10,949,000, a figure which might probably have been increased by as much as 4 or 5 per cent. had the enquiry of 1912 been as comprehensive as those of 1907 and 1924.

For Electric Generators, as for Prime Movers, the Electric Supply Stations account for the largest absolute increase shown in the table. In this case, however, large as was the increase at the Electric Supply Stations, amounting to 293 per cent. in the capacity of the dynamos installed, the increase in generating plant at other works and factories was not much less, namely, 265 per cent. The three groups of trades dominant in their engine equipment were also dominant, though in a less degree, in the capacity of the dynamos with which they were equipped. In 1907 these three groups had 62 per cent. of the capacity of dynamos other than those at Electricity Undertakings, and in 1924 they had 69 per cent. In 1912 they reported 70 per cent. of the total capacity reported other than that of Electricity Supply Stations. Of the increase of dynamo capacity between 1907 and 1924 other than at Electric Supply Stations, these

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

three groups accounted for 72 per cent. The proportionate increase at Mines and Quarries far exceeded even that at Electricity Undertakings, the 1924 total being about 7½ times that recorded for 1907. In all groups other than these two, the capacity of dynamos at factories and works was 591,000 kilowatts in 1907 and 1,725,000 (including 481,000 in reserve or idle) kilowatts in 1924, the percentage increase being 192. The comparative progress before and after 1912 may be judged from the total of about 2,700,000 kilowatts returned as the aggregate capacity of electric generators in that year.

PROGRESS IN PRINCIPAL INDUSTRIES.

It will be of particular interest to compare the figures for 1912 for these principal groups with those in the preceding tables. The particulars are as follows:—

Power.	Mines and Quarries. (1)	Iron and Steel, etc. (2)	Textiles. (3)	Electric Supply. (4)	Total of (1) to (4).
Prime Movers. Thou. H.P.:					
Total, 1907	2,467	2,085	1,894	1,532	7,978
Do. 1912	2,721	2,089	2,119	2,074	9,003
Do. 1924	3,321	2,645	2,218	5,382	13,566
In reserve or idle, 1924	456	651	220	1,151	2,478
Electric Generators. Thou. K.W.:					
Total, 1907	111	246	77	1,002	1,436
Do. 1912	372	340	165	1,454	2,331
Do. 1924	830	663	273	3,943	5,709
In reserve or idle, 1924	236	219	42	821	1,318

The figures given above for the year 1912 are believed to be practically complete except for the Iron and Steel trade, and though in this trade some important firms were found to have failed to furnish complete information the totals were not reduced by a large percentage.

The comparison of the equipment of electric motors in 1912 and in 1924 in the groups of trades distinguished in the table in the previous column, but omitting Electric Supply Undertakings, is shown in the next table, so far as information is available for 1912. It must be remembered that the data for that year were not submitted in all cases to the same examination and completion or revision as would have been the case had the work not been interrupted owing to the war, while the exemption of certain trades, of which Building was by far the most important, from making Returns for 1912 renders the figures for that year rather a means of marking the approximate stage of development then reached than a basis from which subsequent progress can be measured with precision. The absence of corresponding data for 1907, however, gives the defective data for 1912 a value which they would not otherwise have.

ELECTRIC MOTORS IN INDUSTRIAL GROUPS.
1912 AND 1924.

(Thousand Horse-Power.)

Groups of Industries.	Driven by Purchased Electricity.		Driven from Dynamos at the Factories or Works.		Total Electric Motors.		Electric Motors in reserve or idle.
	1912.	1924.	1912.	1924.	1912.	1924.	1924.
Mines and quarries	131	626	408	1,073	539	1,699	230
Iron and steel, engineering, shipbuilding, etc. ...	407	2,144	497	1,023	904	3,167	555
Textiles	68	390	113	306	181	696	60
Food, drink and tobacco ...	60	307	38	92	98	399	36
Paper and printing	71	182	47	118	118	300	34
Building and building materials ...	18	208	41	102	59	310	34
Public utilities* ...	43	158	78	274	121	432	31
Other trades ...	143	542	78	397	221	939	147
Total* ...	941	4,557	1,300	3,385	2,241	7,942	1,127

* Not including electric supply undertakings.

Note.—The particulars for 1912 are incomplete, the chief defect being due to the omission of certain trades, notably the building and contracting trades.

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

It will be seen from the table that, while the capacity of the motors driven by purchased electricity increased by 384 per cent., that of the motors driven from dynamos at the factories and works increased by 160 per cent., the aggregate capacity of all electric motors increasing by 254 per cent. These increases are based on figures for 1912 that are incomplete, but the effect of that lack of completeness would not, it is believed, be sufficient to render the comparison seriously misleading. The three groups shown first in the table possessed 64 per cent. of the capacity recorded for 1912 and 69 per cent. in 1924, so far as relates to motors driven by purchased electricity. Of motors for which the dynamos at factories or works supplied the current, these three groups possessed 78 per cent. of the total capacity in 1912 and 71 per cent. in 1924, the corresponding percentages for all motors being 72 and 70. Bearing in mind the omissions from the 1912 record, the conclusion that the use of electric motors in other trades advanced between 1912 and 1924 more than in these three great groups would not be justified. If as much as 100,000 kilowatts were omitted from the records of those other trades for 1912, the three major groups would account for as high a percentage of the total in 1924 as in 1912. The figures suggest that a relatively larger dependence on purchased electricity for the provision of driving power for electric motors was manifested in these important groups in 1924 than in 1912. The Food and Drink group shows an even greater development in this direction, the comparison of the partial figures for 1912 for the Building and Building Materials group with the complete figures for 1924 being definitely invalid.

Whatever may be doubtful in the comparisons suggested by the table, it appears probable that, both for the Iron and Steel group, and for the aggregate of all other groups, the larger part of the electric-motor capacity in 1912 was dependent on dynamos at the factories and works, while in 1924 well over one-half of the capacity—in the Iron and Steel group two-thirds—depended on purchased current. The Mines and Quarries group and the Public Utilities group show at both dates a greater dependence on their own dynamos than on those of supply stations and other sources from which current was purchased.

PRODUCTION IN GREAT BRITAIN IN 1924—*Continued.*

The fact that the Iron and Steel group accounted for 47 per cent. of the total capacity of motors driven by purchased electricity and for 30 per cent. of that driven from dynamos at the factories and works gives especial interest to the manner in which these two classes of motors were distributed between the trades making up the group. The Returns from Blast Furnaces and from the Tinplate Trade show markedly greater figures for motors driven from dynamos at the works than for those driven by purchased electricity, and the heavy Iron and Steel Trades (Smelting, Rolling, and Founding) show almost as large a figure for the former class as for the latter class. Taking these trades and the Coke Ovens together, the motors driven from dynamos at the works had an aggregate capacity of 568,000 horse-power, and those driven by purchased electricity a capacity of 528,000 horse-power, a figure which would have been reduced by an important amount had combined instead of separate reports been received in respect of Blast Furnaces, Steel Works, and Rolling Mills owned by the same firms. The remaining trades in the Iron and Steel group returned the majority of their electric motors as driven by purchased electricity, shipbuilding and engineering, including motor-vehicle construction, being prominent in this respect. The aggregate capacity of their electric motors amounted to 1,616,000 horse-power driven by purchased electricity and 455,000 horse-power driven from dynamos at the factories and works.

The table includes figures showing the capacity of reserve and idle motors recorded for 1924. In general the proportion of such capacity to the total available capacity in the several groups distinguished in the table was not markedly dissimilar for motors driven by purchased electricity and motors driven from dynamos at factories or works. An exception of some importance is found in the Iron and Steel group, where 21 per cent. of the capacity of the latter class of motors and 16 per cent. of the former was in reserve or idle. For all trades together, the reserve or idle motor capacity was 626,000 horse-power in the case of those driven by purchased electricity, or a little under 14 per cent., and 501,000 horse-power, or nearly 15 per cent., for motors driven from dynamos at the factories or works.